

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE February 1, 1982

SUBJECT Disposal of Dioxin Contaminated Wastes from Cleanup Activities  
in Southwest Missouri

FROM Dick Smith, WMBR/SPFD

*D. Smith*

Site:	<i>Syntex Verona</i>
12#:	<i>Mod 007452154</i>
Break:	<i>1.6</i>
Other:	<i>2-1-82</i>

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TO Robert L. Morby, Chief, WMBR

This memorandum is written to summarize the difficulties encountered by EPA and Syntex Agribusiness, Inc., in developing a feasible means for ultimately disposing of dioxin contaminated wastes. This will provide information on the nature of the problem, the activities already undertaken in response to this problem, and will serve as a decision document for future activities.

Nature of the Problem

During the past two years, several investigative and remedial actions have been conducted by this Region and Syntex at various sites in southwest Missouri where dioxin contaminated wastes were stored or indiscriminately dumped. These actions have generated a significant quantity of various dioxin contaminated wastes which are now being stored by Syntex awaiting final disposal. The nature of these materials along with their volume and dioxin content have been summarized by Syntex in the Waste Inventory Summary which is attached to this memorandum.

In preparing the Waste Inventory Summary, Syntex informally advised us of their particular concerns with (1) the sludge remaining from the detoxification process at Verona, Missouri and with (2) the security of the stored wastes on the Denney Farm. Approximately 300 gallons of residue from the detoxification process remains at the bottom of a steel tank in Verona. This tank is beginning to deteriorate, and Syntex is fearful that this highly contaminated residue may leak into the environment. On the Denney Farm, the isolation of the waste storage area makes vandalism a constant worry even though a sophisticated security system is in operation. Also, the large volume of wastes stored on the Denney Farm is of great concern. The equivalent of 1155 drums of contaminated soil is present in the microbiological degradation basins.

The question of how to ultimately dispose of these dioxin contaminated wastes is one which Syntex and EPA have been trying to answer for some time. Incineration, landfilling, microbiological degradation, and other means of treatment and disposal have been investigated without success. At present there are no incineration facilities permitted for the destruction of dioxin, and most facilities are fearful of adverse publicity. The landfills which might accept dioxin wastes are reluctant to assume the accompanying long term liabilities. The microbiological degradation of dioxin has not developed as quickly as originally expected and is not yet feasible. So, the question of ultimate disposal remains a serious problem. The activities which EPA and Syntex have already taken on this issue are discussed in the proceeding sections.

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SUPERFUND RECORDS

### Syntex Activities to Date

Syntex began its search for a means of ultimate disposal by establishing an in-house task force nearly a year ago. A company engineer is assigned full-time to lead this task force. Syntex has kept this Region informed of their activities through a telephone conference call in November 1981 and a meeting in the Regional Office on January 27, 1982. At this most recent meeting in Kansas City, the company representatives presented a detailed status report on their dioxin disposal research to date. The principal means of disposal investigated by Syntex are incineration and landfilling with pretreatment also studied. A summary of each means of disposal is given in the material below.

Syntex believes that waste incineration is the best approach to pursue since the dioxin would be destructed with little residual ash to dispose of. The facilities capable of destructing dioxin wastes are those incinerators now permitted to handle PCBs. Most of these facilities are reluctant to accept dioxin wastes, fearing adverse publicity. The incineration facilities contacted by Syntex and their responses are listed in the following.

- o The Vulcanus - This ocean incineration vessel has recently completed test burns of PCBs. The facility originally indicated to Syntex that the volume of dioxin wastes that could be burned (liquid wastes only) was too small to be feasible. Syntex intends to reopen discussions with Chemical Waste Management, operators of the Vulcanus.
- o Rollins - This rotary kiln facility is located at Deer Park, Texas and is capable of destructing both solid and liquid dioxin wastes. Rollins gave a negative response when approached by Syntex, citing adverse publicity.
- o Ensco - Another rotary kiln facility which is located at El Dorado, Arkansas. Syntex is still negotiating with this facility, but there is a large backlog of PCB wastes awaiting destruction there.
- o The EPA mobile incinerator - This research facility is a rotary kiln mounted on trailers. Necessary Federal and State permits have yet to be obtained so that test burns can be completed. This facility is one or two years away from being operational.
- o The EPA Pine Bluff incinerator - This is a research facility not yet constructed with operational capabilities probably several years away.

Syntex also researched the possible use of secured chemical landfills for dioxin waste disposal. The facilities contacted are all permitted to receive PCB wastes or else meet the criteria for such wastes. The principal problem encountered with these facilities is their unwillingness to accept the potential long term liabilities associated with dioxin wastes. The landfill facilities contacted by Syntex and their responses are listed below.

- o Rollins - The same company owning the incineration facility gave Sytex a negative response for landfilling dioxin wastes.
- o Waste Management of Alabama - This facility is located at Emmelle, Alabama in deep clay deposits which make it probably the most desirable landfill facility. This is owned by Chemical Waste Management which also owns the incinerator ship, the Vulcanus. The top management of Chemical Waste Management has consistently given Syntex a negative response to utilizing any of its waste disposal facilities. The reasons cited are adverse publicity and long term liability.
- o CECOS - This landfill is located in Ohio near Cincinnati and has accepted wastes from Love Canal, New York. Some dioxin-like wastes (possibly furans) have been disposed of there. Syntex will be considering this facility more seriously in the near future as the management appears more open minded than Chemical Waste Management.
- o KIES, U.S. Pollution Control, and a salt mine in West Germany - These landfill facilities are either not accepting dioxin wastes or are providing long term storage and not disposal.

Syntex has studied the pretreatment of dioxin wastes to reduce their volumes and make them more amenable to the different means of ultimate disposal. The use of activated carbon to remove dioxin from liquids is presently being studied. Also, the use of chemical fixation, such as encapsulation, to make the wastes easier to transport is being studied. None of these pretreatment methods address the issue of final disposal, though.

#### EPA Activities to Date

The activities of this Region to date are (1) the submittal in December 1981 of a memorandum to the Headquarters Dioxin Task Force requesting their assistance in determining a means of ultimate disposal and (2) researching feasible means of disposal. At this time, the Dioxin Task Force has not been able to provide definitive guidance, but the Region has contacted a number of different facilities to determine their feasibility to accept dioxin wastes. Many of these same facilities were also contacted by Syntex, so only the additional information obtained by EPA is present below.

- o Los Alamos Scientific Laboratory incinerator - This Department of Energy research facility is operated under an interagency agreement with EPA for the test burning of PCBs. It is unlikely that this facility would be able to destruct large quantities of wastes.

- o The EPA mobile incinerator - Permitting is expected shortly so that test burns can be completed this summer. The first demonstration will be in the fall for destruction of leachate from the Kin Buc dump in New Jersey. The researchers are confident that the dioxin-containing leachate will be destructed. After this single demonstration the mobile incinerator has no further commitments and could possibly come to this Region in 1983. However, the Dioxin Task Force advises that Superfund sites will likely have priority on its use. Nonetheless, further contact will be made by the Region concerning utilization of this facility.
- o Pyromagnetics - This incineration company is developing an off-shore facility, 60 miles south of Mobile, Alabama. Headquarters is obtaining the necessary permitting. It is unknown at this time whether this facility will ever become feasible.
- o Microbiological degradation - Research at the Universities of Illinois and Michigan State is progressing slowly. This is not expected to be a feasible means of dioxin destruction in the near future.
- o Waste Management of Alabama - Some dioxin containing wastes may have been disposed of at this landfill facility recently. Syntex will check with this facility again.

#### Future EPA Activities

From the preceeding information it is evident that the disposal options are quite limited for Syntex to pursue. There is the distinct possibility that no feasible means of ultimate disposal will be developed within the next one or two years. This can become a major problem with the Syntex storage facilities already exhausted and the tankage containing residues from the photolysis process beginning to deteriorate. Future investigative and remedial actions at the remaining dioxin sites will likely generate additional quantities of contaminated materials further necessitating the development of a satisfactory means of ultimate disposal.

At this point, it becomes necessary to know what the extent of future EPA activities should be. The Regional staff can devote varying amounts of effort to solving this problem, ranging from minimal involvement to a substantial amount of staff effort. In brief the following three options are presented for a decision to be made:

1. A minimal amount of staff effort should be expended toward developing a means of ultimate dioxin disposal. This might simply involve maintaining contacts with Syntex and the Dioxin Task Force in Headquarters and monitoring their progress on this project.

Agree \_\_\_\_\_

Disagree \_\_\_\_\_

Comments:

2. A moderate amount of staff effort should be spent on this project. This might involve (1) regularly contacting Syntex and the Dioxin Task Force and (2) pursuing contacts with commercial waste disposal facilities and EPA research projects, including the mobile incinerator.

Agree \_\_\_\_\_

Disagree \_\_\_\_\_

Comments:

3. A substantial amount of staff effort should be expended on this project. This might involve in addition to the items mentioned in option 2, (1) the formation of a Region VII Task Force and (2) a major effort to obtain the mobile incinerator for a demonstration project in southwest Missouri.

Agree \_\_\_\_\_

Disagree \_\_\_\_\_

Comments:

Attachment

# WASTE INVENTORY SUMMARY

## I. Denney Farm Site:

### A. Stored in Drums.

Waste Type	Volume (Gallons) <sup>1/</sup> With Dioxin Content (ppm)		
	None Detected (N.D.) <sup>2/</sup>	N.D.-50	50-2000
Liquids (Water/Solvents Mixed)	520	1421	90
Oil	-	-	397
Solids <sup>3/</sup>	100	3048	65
Miscellaneous, trash <sup>4/</sup>	-	28 drums (= 1540 gals.)	-

B. Stored in Microbial Degradation Basin #1 (MDB #1): Soil (220 yd<sup>3</sup> = 1155 drums).

C. Stored in MDB #2: Decontamination rinse water (925.65 gal.).

## II. Waste Created by the EPA During Its Investigation of the Denney Farm Site (now stored in drums):

Waste Type	Volume (Gallons) <sup>1/</sup> With Dioxin Content (ppm)		
	N.D. <sup>2/</sup>	N.D.-50	50-2000
Water	-	330	-
Solvents/Unknowns	-	220	-
Miscellaneous, trash <sup>5/</sup>	-	12 drums (= 660 gals.)	-

<sup>1/</sup> All volumes are based on individual drum volume estimates made at the time the drum was filled.

<sup>2/</sup> The analytical sensitivity, in most cases, was 2 parts per billion.

<sup>3/</sup> Over one half of the solid material is visibly contaminated soil; the remainder is filter cake and other unknown chemical solids. Most are wet with water or solvents.

<sup>4/</sup> This material includes a plastic trench cap liner and contaminated trash. Dioxin content is estimated.

<sup>5/</sup> This material includes coveralls, gloves and other contaminated trash.

III. Residual Wastes from the Detoxification Process Located in Verona, Missouri:

Waste Type	Volume (Gallons) With Dioxin Content (ppm)		
	N.D. <sup>2/</sup>	N.D.-50	50-2000
Water, Caustic <sup>6/</sup>	80	73110	-
Hexane, IPA <sup>7/</sup>	-	9510	-
Oil <sup>7/</sup>	-	4020	300 <sup>8/</sup>
Miscellaneous, trash <sup>9/</sup>	-	20 drums (= 1115 gals.)	-

IV. Totals:

Waste Type	Volume (Gallons) With Dioxin Content (ppm)		
	N.D. <sup>2/</sup>	N.D.-50	50-2000
Water	80	74366	-
Solvents	-	9730	-
Water/Solvents Mixed	520	1421	90
Oil	-	4020	697
Solids	100	3048	65
Soil	-	1155 drums (= 44431 gals.)	-
Miscellaneous, trash	-	60 drums <sup>10/</sup> (= 3315 gals.)	-

<sup>6/</sup>The volumes of these materials, which are now stored in tanks and dikes, are based on best estimates.

<sup>7/</sup>These materials are contained in tanks with dikes beneath them, inside the secured detoxification area.

<sup>8/</sup>This material is the sludge in bottom of the original NEPACCO waste tank.

<sup>9/</sup>This waste includes contaminated trash, Crider Farm produce materials and 15 bales of hay. The material is stored inside or in the immediate vicinity of a storage shed in the secured detoxification area.

<sup>10/</sup>This total does not include the 15 hay bales referred to in footnote 9 which have not yet been placed in drums.